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AGRICULTURE, SHIKAR & TRAVEL

EDITED BY

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X

THE

INDIAN FORESTER.

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The Hill Forests of Java.

a.—The Vegetation on the Peaks of Java.

The highest summit in W. Java attains an elevation of 9,326 feet and forms a plateau with a central depression, the crater of an extinct volcano. This plateau is occupied by bushes 8 to 10 feet high, and is covered with a short turf, whilst the slopes 500 feet lower show a thick but not tall forest growth: below this again there follows a region where the vegetation gradually approaches that of the cloud zone.

Local influences affect the character of this region even more than the elevation, otherwise these forests might be treated of as sub-Alpine; for instance, the meadows, which, though not so marked as in East Java, should yet show in the most marked way the alpine characteristics of this area, are often found not above but below the forest limit. But these forests, on the other hand, possess the characteristics so peculiar to high elevations, namely (1) that of crooked and knotty growth, the stems being short and thick, crooked and often horizontal, with twigless branches which twist in every direction and bear a few leathery leaves at their extremities: (2) the umbrella formation of the crown, built up of many branches and scanty foliage: (3) the relative proportion of foliage and timber which in the cloud zone altered in so marked a manner, is here even still more evident and is more noticeable even than in Europe: (4) the trees are covered with thick layers of moss, but not so profusely as in the lower region; and amongst the moss a few small ferns and epiphytes, and a small red-flowered orchid with thick leathery leaves and large roots is observable. The same varieties are present, but in much greater number in the cloud region. It is difficult to recognise the various species for although the forests are not dense, the confusion of twisted boughs and dead wood is amazing.

Aralia, *Myrsine avenis*, *Vaccinium floribundum*, *Dicalyx sessilifolius* and a *Hypericum* are common, whilst the giant

Edelweiss *Anaphalis javanica* forms large bushes inside the crater. The ground is not well covered under the twisted forest growth; there is a dense layer of dead leaves from which the yellow and red spotted flowers of *Balanophora elongata* appear. A few ferns, a white orchid, *Ranunculus*, bushes of a Cyperacea, some grasses and brambles, flourish here and there between the tree trunks whose bases are surrounded, when not covered with moss, with the beautiful *Nertera depressa*. In open places where the sunshine can penetrate, the vegetation is more luxuriant, and here are whole beds of *Primula imperialis*, only found on this mountain peak, which reaches a height of 3 feet and bears 3 or 4 flowering heads; other flowers such as *Sanicula montana*, *Ranunculus javanus*, *Ophelia javanica*, are also found, and the stems of *Crawfurdia* twine on the tree trunks.

The woody growth in this region attests the dryness of the atmosphere, whilst the undergrowth shows the presence of more moisture. The bushes which grow on the summit of the mountain, show, in a still more marked degree, the absence of moisture, they are generally evergreens with hard, thick, hairy leaves. The most common of these are *Anaphalis javanica* (which, however, has soft leaves) *Vaccinium varingiæfolium*, and *V. floribundum*, *Rhododendron retusum*, *Gaultheria punctata* and *leucocarpa*, *Myrsine avenis*, etc, etc; there is also a small climber *Lonicera axylepis*.

Tree ferns (*Cyathea* and *Alsophila*) with massive stems, reach as high as these bushes, whilst these again are overtopped by specimens of *Leptospermum floribundum* whose umbrella-shaped crown is covered with white myrtle-like blossoms.

There are no Epiphytes, the bushes are only occasionally moss grown but lichens are numerous. This distinction between tree and shrub growth is, of course, attributable to the falling off in moisture in the localities where shrubs abound. Herb growth consists of *Plantago Haskarlii*, *Myriactis pilosa*, *Ophelia javanica*, etc., and of large ferns such as *Aspidium aculeatum*, *Lycopodium*, sp. The open meadow land near the crater bears scattered bushes and patches of a grey white hairy moss, (*Racomitrium*); in these fields of moss the truly Alpine *Gentiana quadrifida*, *Gnaphalium javanum* and *Veronica javanum* exist.

b.—The Vegetation on the Peaks of Eastern Java.

The characteristics of the vegetation towards the summit of the mountains in Eastern Java are similar to these described in part 2 b. of these notes; tree growth and species remain the same up to the upper limit of vegetation, where appear *Vaccinium Miquelii* and a few Ericaceæ. With a rise in elevation the Casuarina lose in height and become gnarled and the same is the case with *Quercus pruinosa*; the boles of both these trees become shorter, the branches twisted, the crown flat, whilst the foliage diminishes greatly.

Tree growth ceases very suddenly, and forest is replaced by open meadows on which clumps of a small leaved grass flourish, this is probably *Festuca nubigena*. Between these clumps the soil is either bare or covered with the creeping small hard-leaved *Leucopogon Javanica*, which may be met with at lower elevations in the Casuarina forest, and with Festuca forms the chief vegetation of this region.

Besides these, *Alchemilla villosa* with small hairy leaves and an enormous rhizome; *Pimpinella Pruatjan* with small stem and massive roots; *Polygonum paniculatum*, *Wahlenbergia lavandulaefolia*, a small violet, and two true Alpine plants, *Gnaphalium* sp and *Gentiana quadrifida* may be observed. The only plant with a large flower is a fine *Hypericum*. In clefts in the rock and similar places, one may remark specimens of Casuarina and Vaccinium knotted and stunted by the climate. On the highest peak two shrubs, *Photinia intergrifolia* and *Coprosma sundana* exist, from whose green bell-shaped flowers the long stamen or pistil protrudes.

It will be evident that the vegetation of the mountain peaks in Java is somewhat similar to that of the Alps and Pyrenees. The diminution and final cessation of tree growth, the increase of the bole and decrease of the foliage, the presence of a crooked and twisted growth, the remarkable growth of the root—all point to the existence of an Alpine flora which formerly suffered from a rigorous climate, an excessive snow fall, and the shortness of the period of active vegetation, whereas at present on these mountains there is no break in the period of vegetation, no snow fall, and only occasional frosty nights.

We can only seek for the causes of the appearance of these characteristics of an Alpine flora in the vegetation of the mountains of Java, in the circumstances which are common both to these and European mountains. Such circumstances are the rarified air, the great power of sunlight and the dryness of the atmosphere; all these are factors which with increasing evaporation render more difficult the supply of water necessary to plant life. A closer investigation of the anatomical structure and a comparision of Alpine vegetation with that of dry places. for instance that of deserts, proves that the requirements in moisture of trees and shrubs at the highest elevations is alone the cause of any peculiarity in structure. This is further proved by the fact that the presence of Alpine flora in Java is only noticeable where there is a great scarcity of water. Thus, in the cloud and moist zones of these forests, a number of the species present in the upper forests exist as epiphytes on the dry trunks of trees but not on the ground itself; but are found on the ground so soon as the soil contains a large proportion of salts which necessitate a large consumption of water by the plant, as on the sea shores.

A. F. W. SCHIMPER,

(In the *Forstlich-naturwissenschaftliche Zeitschrift.*)

Seeding of Strobilanthes on the Nilgiris.

All species of Strobilanthes with the exception of three, have flowered and seeded on the grass lands and Sholas of the Nilgiris. The common Strobilanthes first began flowering in 1892 and by March 1893, the hill sides were covered with dead bushes and the ground with seeds.

The shade-loving species next commenced to flower in 1892 and the Sholas were gay with the bright, blue, pink and violet blossoms, which attracted swarms of bees from the great forests of the Wynaad. The large bee *Apis dorsata* was especially abundant, immense swarms settling on the Blue gums in Ootacamund and building their combs on them, and on every precipice along the verge of the Ghats. The honey, though fairly well flavoured, was dark and treacly looking. Most of these bees at high elevations, perished during the frosts of January and February 1893, and the ground, in places, was covered with their dead bodies.

There was a general migration of jungle fowl from the Ghat Sholas, as soon as the seed was shed, and I counted no less than 42 in one covey and 18 in another, all busy feeding on the fallen seeds.

The Sholas are now full of the dead and fallen stems and it is a work of great difficulty to force one's way through most of them. The danger from fire has been great, and it was necessary to burn off the grass round the edges of most of the Sholas to prevent fire from entering.

The ground is now covered with seedlings from 1 inch to 6 inches high.

R. M.

Forest Offences.

In its review of the administration report of the Presidency Forests for the year 1891-92, the Government of Madras, referring to the high percentage of acquittals in some of the Districts, remarks thus :—

"The figures for these Districts are most unsatisfactory and 'probably evidence, as the Board points out, trumping up of 'charges by subordinates and neglect on the part of District Forest 'Officers to enquire into cases before directing the institution of 'prosecution." The high percentage of acquittals inclines the Government to come to two conclusions, to wit, (1) that charges are trumped up by forest subordinates, and (2) that District Forest Officers do not inquire into cases before they are prosecuted.

The question of forest offences and their treatment is one of very great importance and in fact "there is no matter connected with its (Forest Department's) working that demands closer 'attention from all who are connected with its administration" as the Editor of the *Madras Mail* observes in one of his leading articles. It therefore deserves to be more fully treated than my limited knowledge and experience will allow, and I, therefore, submit the following few remarks, in the hope that some abler and more experienced Forest Officers will discuss the subject, more fully, in the pages of the *Indian Forester*.

Now, to discuss the above two conclusions of the Madras Government. As regards the first, all that I wish to say is that there are other causes than the mere falseness of a case that may account for acquittal. One of these causes is the easy tampering with the prosecution evidence. Although this explanation was deemed unsatisfactory by the Conservator, the Board and the Government, yet it is a fact that several cases fall through by this cause. For it is rare that a Forest Officer meets with a respectable and truth-loving-man in his forest when he detects an offence. It will generally be an ordinary ryot if at all, probably a neighbour of the offender, that may have witnessed the offence, and it is this man that is cited as a witness. I leave it to your readers, especially such as have frequently dealt with the detection and prosecution of forest offences personally, to say whether a ryot is likely to be favourable to the Forest Department, which he looks upon with no ill-concealed hatred and aversion, or whether he is likely to help his own neighbour, and that, too, under the pressure of his village head and of the influential members of the village, which is sure to be brought to bear upon him. If the witness is devoid of neighbourly feelings or is proof against any pressure from an influential quarter, then is applied the pressure of that charm-worker money. To secure a man who will withstand the above influences is to seek for a truth-loving and honest man, and where is the Forest Guard or his Watcher to find such a man in the midst of a forest? I have had many a true case in my short career, which fell through by this cause.

The second cause is the apathy, or rather the want of sympathy, of the Magistrate who tries the cases, with the Forest Department. As a rule, it is a Subordinate Revenue Officer, who is generally also a Magistrate, that hears Forest Offence cases. As a Revenue Officer his sympathies are more with the ryot classes than with the Forest Department, which he generally believes to be very tyrannical and oppressive. Moreover, he has reason to look upon the Forest Department with some aversion at least, for it has snatched away from him the almost unbounded control he once had over the jungles in his jurisdiction, prior to the advent of that Department. Happily, this state of feeling is gradually and rapidly subsiding under the influence of education, and a better

understanding of the Forest Laws and their beneficial objects is gaining ground among Magistrates.

The third cause may be insufficiency of evidence. This is easily understood when it is remembered that a forest offence is generally committed in a forest where there are not likely to be any persons besides the forest subordinates. In many cases, the detector may be the only person who saw the commission of the offence. In such cases, only the evidence of forest subordinates will be available. It is natural that the Magistrate should feel diffident to convict a person on the uncorroborated testimony of a low paid guard or watcher, even though the case may be perfectly true.

From the foregoing, I hope I shall not be understood to offer any hostile criticisms on the remarks of the Board and Government. I am far from it, especially when I know that it is only natural that such a conclusion should be arrived at by any one who notices such a large proportion of acquittals, unless they are accompanied by a different explanation. It is unfortunate that this high percentage of acquittals was not explained fully in the District reports. My object in writing at this length on this point is simply to point out that there are circumstances other than the mere trumping up of charges that may bring about the acquittal of forest offences.

From the above remarks, I do not mean to say that Forest Subordinates are incapable of trumping up cases, although I heartily wish I could say so. On the other hand, many of these acquitted cases may have been trumped up ones. It is not altogether uncommon for forest guards who are low paid, to cook up a case against an individual who has refused them a meal or *buck-sheesh* on a festive day. But that it is a general practice is hard of belief.

The main point to consider is, how to minimize the percentage of acquittals of forest cases ? The obvious answer is to hold a preliminary inquiry into every case departmentally and if its result shows that the case is true and will stand magisterial inquiry, then only to institute prosecution. This leads to a discussion of the second conclusion at which the Government has arrived.

Now as regards inquiry into cases by District Forest Officers, the Government is pleased to believe that no such inquiries are held, and that District Forest Officers neglect their duties in this direction. It is true that preliminary enquiries are not generally made by District Forest Officers before cases are sent up to Magistrates for trial. It seems to me that this is because it is not possible for a District Forest Officer to enquire into every case in his District personally, even if he can afford time to do so, with his thousand and one other duties. It is not in one place and at one time that all the forest offences are committed in a District in the course of a year. Offences occur all round the year and in all

parts of the District, and I am sure that the Board and Government would not have their District Forest Officer run about his whole District, and at all times when offences are reported, to enquire into them for reasons too obvious to require explanation. Even supposing that this were possible, what length of time would elapse between the date of detection and that of complaint to the Magistrate which could only be lodged after the District Forest Officer's enquiry into the case? For all I know, it may be several months. Cases taken to Magistrates after such long delays have fewer chances of success.

It is clear from the above remarks that it impossible for District Forest Officers to enquire into all forest offences reported to them by their subordinates before the institution of prosecutions

"Why do not then," it may be asked, the Rangers and Sub-Divisional Officers enquire into cases before they submit their subordinates' crime reports to the District Forest Officer for orders? My object in intruding upon your readers with this article and of craving a space for it in your Journal is to excite a full and exhaustive discussion of the answer to the above question. The only answer that can at present be given to it, is that Range Officers (including Sub-Assistant Conservators who are not in independent charges of Districts) are not competent to hold inquiries into forest offences and hence the omission on their part to enquire into cases.

Taking the latest revised Rules published under section 63 (*a*) of the Madras Forest Act by the Government of Madras, we find there, that it is only District Forest Officers that are competent to summon witnesses and to hold enquiries into forest offences, &c. This means plainly that the subordinates of District Forest Officers, whatever their rank and grade, are incompetent to enquire into cases, and enquiries made by them are therefore illegal or at any rate not sanctioned by law. Someone of your readers may say "what if the Subordinates Officers are not legally empowered to 'enquire into cases; they can surely examine the parties concerned, 'take notes for their satisfaction, and report the case to their District 'Forest Officer with the result of their examination." This may be done only when parties care to appear before such officers and even if they appear, only when they answer the question truly and honestly. Supposing they refuse to appear before subordinates without a formal summons, or to answer questions put to them, or give false and incorrect information. What then? What sections of the Forest Act can be resorted to for punishing them? None at all. I doubt even if any provisions of the Penal Code can be applied to such cases. These are not mere imaginary difficulties, for I have had to report upwords of 700 cases within my short career in the Department as a Forest Ranger, and in several cases I could not secure the parties to come and say before me what they knew of them, even though I went to their villages, served written notice on them to appear before me and so on. These difficulties are more

clearly and keenly felt in those places where there are half educated persons who know something of Forest *Law*.

I hope I have made it pretty clear from the foregoing remarks, that it is owing to a defect in Forest Law that cases have to be sent up to the Magistracy without any departmental preliminary inquiry into their merits, and that the existing provision to enable a departmental enquiry previous to recourse to a Court of Law is insufficient and impossible to be practically worked to the required extent. The defect I refer to is obviously the provision in the existing Forest Law empowering Range Officers and Sub-Divisional Officers *to summon parties and to enquire into forest offences*.

This leads to a consideration of the expediency and advisability of investing Forest Range Officers and Sub-Divisional Forest Officers with the powers of (1) compelling the attendence of witnesses, &c., and (2) holding inquiry into forest cases, powers which fall under section 160 and 161 of the Criminal Proceedure Code. If the Government is determined to put a stop to this high percentage of acquittals it can do so only by insisting upon the Forest Department sending only such cases for trial as are in all probability certain of conviction. To ascertain this is to institute Departmental enquiry into every case. To expect this to be done by the District Forest Officer himself personally and unaided is to expect an impossibility as has been already pointed out. It therefore comes to this that the Subordinate Executive Forest Officers must be placed in a position to conduct these preliminary enquiries by being invested with the needful legal powers. I feel no doubt that the Government would not only consider favorably a proposal to invest the Executive Subordinates with such powers but that it would also grant the same, if the matter is properly represented by the competent authority *i. e.* Conservators in consultation with Collectors. I do not in the least think that Government would object to such a proposal on the score of abuse of the powers by subordinates, for in other Departments, officers of lower rank and pay than Forest Rangers of higher grades, such as Head Constables of the Police and Sub-Inspectors of the Salt and Abkari Departments are not only invested with the power of summoning parties, but in the case of Head Constables are empowered also to hold preliminary enquiries into cases. Moreover, is it likely that the Government would show a want of confidence in its Forest Rangers and Subordinate Forest Officers of higher ranks by refusing to entrust them with these powers which can hardly be turned into weapons of oppression, when we remember that it has entrusted them with the more responsible power of arresting persons for breaches of Forest Laws.

The subject is one of much importance and deserves to be fully discussed. I hope that an earnest discussion of the subject will be started in the *Indian Forester*, and that it will bear good fruit.

KASSAU.

IV.—REVIEWS.

The Protection of Woodlands by Dr. J. Nisbet.

We have received, by the kindness of the translator, a copy of his book "The Protection of Woodlands' a translation from the German work of Dr. Hermaun Fürst, Director of the Bavarian Forest Institute at Aschaffenburg, and we have found it very interesting. In his Preface, Mr. Nisbet tells us that after considering whether a short manual on the subject would not be desirable, he came to the conclusion that a translation of Dr. Fürst's work, arranged for the fourth edition of Dr. Kauschiger's 'Lehre vom Waldschutz' would probaoly be ot practical benefit to sylviculturists in England and Scotland, and most particularly in drawing attention to the dangers of *pure* forest, so liable to insect and fungoid diseases.

The *first section* treats of the Protection of Woods against injuries due to inorganic agencies, such as frost, heat, rain, snow, storms, lightning and also from unfavourable soil and situation. All these are carefully treated one by one, their effects upon the principal trees are studied and described, and preventive measures are suggested as well as remedial ones where such are possible. The recommendations seem good and practical but we venture to think that in speaking of the precautions to be taken to prevent the fungoid infection at page 62 there must be some mistake and that with storms coming from the westward it is on that side of the infected area that nurseries should be placed, if the carriage of spores from the forest to them is to be avoided.

The *second section* treats of the Protection of Woods against agencies, such as weeds, parasitic plants, and animals of all kinds especially destructive moths and beetles. This notice, as may be expected, occupies much the largest part of the work and contains a large amount of valuable and useful and interesting information. There are a few plates of the most important of destructive insects, but we should have liked to have seen more figures and to have had these in the pages of the work and not relegated to the end. To those who have not specially studied entomology, good pictures are of the greatest assistance.

The *third section* and last, treats of the protection of Forest boundaries, the protection against misuse of rights, against forest offences, against fire, and against damage from smoke and atmospheric impurities.

The book is well got up, it is published by David Douglas of Edinburgh and is dedicated to our Inspector-General of Forests, Mr. B. Ribbentrop C. I. E The print is very good and though we are scarcely well qualified to judge, the translation seems excellent. Here and there we have noticed phrases which are slightly German in style and some of the words used are rather doubtful, for instance 'cortaceous bark,' which occurs more than once, seems a curious phrase and is not very clear, indeed we doubt if the word is an admissible one for the Latin word is properly 'corticeus.' However, this is a very small matter, and we congratulate Mr. Nisbet upon a successful piece of work that must have occupied a considerable part of the time of his furlough.

Annual Agricultural Report of Bengal for 1892-93.

We see from this Report, lately received, that the question of inducing zemindars in permanently settled estates to adopt measures of forest preservation, has been seriously started, and it is to be regretted that the service of a Forest Officer to assist in the work could not be spared.

The establishment of fuel, fodder and pasture reserves also engages attention, especially in Chittagong and Orissa. From the latter Province the Settlement Officer, Mr. H. Reily writes "in 'the upland laterite treats, where population is sparse and cattle are 'few, forests are being recklessly denuded by indiscriminate cut-'ting and grazing of cattle, but there is no immediate necessity for 'establishing reserves in those parts." This is somewhat contradictory and not very logical.

Casuarina plantations are being started in the Civil Station of Puri, we presume on coast sands. We shall be interested to hear the result of this; it might almost be worth while to do the thing properly and protect the coast between Puri and the Black Pagoda by a good Casuarina belt like that of the Nellore and Chingleput Districts further South.

Date-palms are reported to be doing well at Hazaribagh, Ranchi and Sasseram, and badly at Patna.

The experiments in the reclamation of 'usar' lands in Behar by means of growing the "*Pithecolobium Saman* and *Albizzia procera* are being continued, though the results, so far, have not established the possession by those trees of any special virtue in reclaiming saline lands. Perhaps the trees are too far apart and too young yet for accurate judgment of results.

As soon as the mass of charcoal becomes a dark red and if it no longer smokes, proceed to extinguish.

For this purpose, ascertain that the earth has not run down the chimneys, and if it is about 50 c/m. above the ground; bury completely the air pipes, examine likewise the upper part and then leave the oven alone for 15 to 20 hours, there will be no more fire.

To facilitate the extinction before closing the man-hole, throw on the top of the pile of charcoal three or four handsfull of green or grey litter or anything that will clear the smoke. Finally if water can be procured pour on the head of the cone of charcoal 2 water-cans full.

7. *Emptying the Oven.*

This operation must be done quickly, especially if it is windy for fear of the fire spreading. Lift up the panel door at the top, then the one at the bottom, take out the charcoal by means of a hook; charcoal should be taken first of all from the centre and then from the bottom when half a sackful has been drawn out, place it in a semicircle as far as possible from the door. The embers must be put by themselves.

The charcoal must not be put into sacks until three or four hours after it has been taken out of the oven, the longer the charcoal is left in the air, the firmer it will be and the less apt to break.

In case of fire in the centre which happens if the rotten wood has not been thrown out, or if the fissures have been badly stopped up, throw on the fire some fresh and fine earth and immediately turn out the charcoal.

The emptying of the oven must be fully completed before leaving it.

General Rules.

1. The ground must always be level and rather slightly damp than dry.
2. Wood which is more than 6 to 7 c/m. in diameter must be split and in spite of the outlay which this work necessitates, there is a very great advantage in performing it not only with regard to the quality, but also for the sake of the yielding.
3. The smoke must always be white, except towards the end of the operation when it becomes blue.
4. From the time of laying the fire to the extinction thereof, not more than 30 to 36 hours should elapse.
5. A good lighting and a rapid heating is very essential, it is the secret of the operation.
6. When once the lighting hole and the buses are well closed, avoid any draught going through the mass.

J. W. CHERRY.

Letter No. 1898 dated 25th November 1893, from O. Wolfe Murray, Esqr., Collector of Nilgiris, to the Conservator of Forests, S. C.

With reference to your letter No. 1801 dated 18th August 1893, I have the honor to furnish you with the necessary information.

A copy of the instructions received from the Director-General of Stores, London, is enclosed, which gives a description and plan of the kilns.

2. One kiln was obtained in 1886, at a cost of Rs 627-7-11, delivered at Coonoor, and 2 more arrived in December 1890, at a cost of Rs. 1,345-13-9. These are now in the Ootacamund Range.

3. All three were used for burning charcoal and acacia wood were used.

4. From October 1886, up to the end of March 1893, 1,928,100 lbs of wood were burnt in the Kiln at Coonoor which yielded 309,754 lbs. of Charcoal or 19·06 per cent. The cost of working including the value of the wood, wages or burners, &c., amounted to Rs. 4,020. The interest on the outlay and the cost of supervision has not been added, also repair charges. amounted to Rs. 150. This kiln is now almost worn out.

In the two kilns at Ootacamund 4,389,875 lbs. of wood were burnt from December 1890, up to the end of March 1893. 734,384 lbs. of charcoal were produced-17·7 per cent. The cost of working was Rs. 7,831 and the value of the charcoal Rs. 9,835 the, profit being Rs 2,004 The bottom portions of these Kilns are worn out and brick protecting walls have had to be erected.

The native system of manufacturing charcoal has not been successful. The out-turn of charcoal to the wood used seldom exceeds 11 per cent and the cost of making the kilns and wages of the burners exceed the value of the charcoal produced.

The Moreau kilns are the best portable kilns extant; but if the sheet iron of which they are made were thicker, they would last longer, as it is, the iron burns out at the base after a few years' work.

Mr. Morgan has invented a charcoal kiln made entirely of bricks which only costs Rs. 70 and produces quite as good an out-turn of charcoal as the Moreau kilns. These brick-made kilns are now largely used for the production of charcoal in the District.

NOTE.—The above papers have been sent to us by the Inspector-General of Forests for publication. We think it right to mention that the introduction of the Moreau Kiln was due to our own arrangements when in charge of a Circle in the Madras Presidency. The successful working of the Coonoor Kiln was primarily due to the pains taken by the then Ranger Mr. Nullasacomy Naidu.

HON. ED.

considerably in the future, and which is the main reason why the prospects in the present are so poor. Let there be agitation for improved prospects in Bombay where the percentage of plums are so inferior as compared to the P. W. D., not to mention the Police, which possesses a percentage of 10·63, including the appointment of Commissioner of Police, Bombay.

CRITIC.

February 21st, 1894.

NOTE.—We feel sure that the sympathies of the Department will be with our Bombay comrades in this matter. We never could understand why the Northern and Sind Circles of Bombay were not considered fit for Conservators' appointments. To give those officers the pay of 3rd Grade Conservators instead of that of 1st Grade Deputies would only cost an extra Rs. 400 monthly and the money might possibly be saved in other ways.

HON. ED.

Reduction of the Imperial Forest Service.

SIR,

Re the absorption of appointments from the INDIAN FOREST SERVICE to the PROVINCIAL FOREST SERVICE in accordance with Section 19 of the Forest Departmental Code 4th edition.

It will be noticed in the half-yearly List of Forest Officers for 1st January 1894, just published, that a 4th grade Deputy Conservatorship on Rs. 550 is to be absorbed from the Punjab-Central Provinces-Berar-Coorg list to the Central Provinces Provincial Forest Service to supply a 4th grade Extra Deputy Conservatorship on Rs. 450.

Is there any reason why a 1st grade Assistant Conservatorship on Rs. 450 only should be done away with on the list to supply the 4th grade Extra Deputy Conservatorship on Rs. 450? If there is not, surely it would not be quite so hard on the officers on a list in which promotion is already so slow, if only the 1st grade Assistant Conservatorship were done away with instead of the 4th grade Deputy Conservatorship.

If it is to be the rule otherwise, we may expect next to see the few 1st grade Deputy Conservatorships on Rs. 900 being absorbed into the Provincial Service to make 1st grade Extra Deputy Conservatorships on Rs. 600, whereas a 3rd grade Deputy Conservatorship would more than supply the needful money.

Either way would apparently be in accordance with the Code.

NA-UMMED.

Pension Rules of Forest Officers.

SIR,

May I ask attention to para. 17 of the Regulations for the Forest Service Branch of the Royal Indian Engineering College, Coopers Hill, for 1894, as recently circulated to us by the Government of India. It is thus stated:—

"The more favourable pension rules have recently been extended to Forest officers appointed from England, *who are thus 'placed on an equality with* Public Works Officers appointed from 'Coopers Hill College. Any Forest Officer, who has rendered not 'less than three years' approved service at the *head of his department*, 'has *also* been made eligible for an extra pension of Rs. 1,000 per 'annum." The italicised words are those to which I would invite attention, and I would ask who can place faith in a Government that thus deliberately stretches the facts in what is practically a public advertisement to catch recruits.

The facts, of course, are well known to us out here, and these are that the more favourable pension rules, as extended to the Forest Department, do *not* place the Department on an equality with the Public Works Department. Conservators are graded in the matter of pay with Superintending Engineers, and under Article 714 (*b*) of the Civil Service Regulations, Superintending Engineers of 3 years service, as such, are entitled to an extra Rs. 1,000 per annum pension—but in this Department this will only be given to the "head" of the Department, the Inspector-General, who is graded as a Chief Engineer in the Public Works Department (the Chief Engineer being entitled to an extra Rs. 2,000 per annum) but will only get Rs. 1,000 as an extra pension. I suppose there must be a specially clever man somewhere at home who can show and believes that there are no differences at all, and that man ought to be brought out here to solve the Currency question.

F. O. B.

III. OFFICIAL PAPERS, CORRESPONDENCE, ETC.

Note on Extraction of Agave Americana Fibre at Coimbatore.

When on tour in the Madras Presidency in 1892 I was much struck with the excellent quality of the fibre of *Agave americana*, which was exposed for sale in many shops in the Coimbatore bazar.

A small quantity of the fibre was sent for report to the Imperial Institute, in connection with which I was at that time engaged in the investigation of fibres of Indian production which are, or might be, utilized for brush manufacture.*

Quite recently, the Madras Agri-Horticultural Society received a communication from Dr. T. Cooke, Technical Sub-Director of the Imperial Institute, South Kensington, stating that fibre of *Agave americana* (grown, I take it in the gardens at Madras) has been very well reported on, and is considered to be nearly as good as Manilla hemp.

The only specimens of fibre of *Agave americana* which were sent to the Imperial Institute from the Madras Presidency were those obtained by myself at Coimbatore, which must be those which have been thus favorably reported on.

Dr. Cooke's letter to the Agri-Horticultural Society was communicated to me, together with a series of questions by a fibre expert, I accordingly deputed the Museum Herbarium Keeper to visit Coimbatore and gave him specific instructions as to the nature of the inquiries which he was to make. The result of his inquiries *in loco* is embodied in the following note—

Agave americana grows in all soils (red, black and gravel) in the Coimbatore district. It is planted extensively as a protective hedge along the Madras Railway line, and flourishes, in the open, freely exposed to the sun, and unsheltered by trees, shrubs, &c. In some places between Coimbatore and Erode where the agave is overgrown with creepers, the plants are unhealthy; and in other places (*e.g.*, near Tudiyalur), plants which are shaded by tamarind, nim and other trees, are stunted, while those which grow in the open, are rich in leaves and luxuriant in growth.

The age of the plants from which the leaves are taken for fibre is six to seven years. The old green leaves falling outwards from the central stem are cut for fibre.

The fibre is, as a general rule, extracted immediately after the leaves have been cut, or after a lapse of a few hours. Sometimes, however, the leaves are kept for a day or two and the fibre is extracted when the people have leisure.

The extraction of the fibre is performed by hand and no machinery is used. The fibre is extracted by two methods, *viz.* (*a*) scraping and (*b*) maceration.

(*a*) *Scraping.*—The leaves are cut, the sharp spines removed with a knife, and about six inches cut off for the top of the leaf. The leaf is then split longitudinally into four or five pieces, which are beaten with a wooden mallet and placed on a board 4′ × 4″ × 3″ held firmly by the toes. The pulp is then removed by means of a bamboo scraper, one edge of which is shaped in the form of a blade, and the fibre dried by exposure to the sun.

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* See Imperial Institute, *Hand-book of Commercial Products*, No. 12, Fibres used for Brush-making.

The fibre obtained by this simple process without washing or bleaching is very clean and free from pulp. The staple is not, however, very long. It is made into thread, which is used in weaving grass mats.

(*b*) *Maceration.*—As in the previous method of fibre-extraction, the leaves are cut, and the spines removed. The whole leaf is then beaten with a wooden mallet, and thrown in bundles into tanks or wells, in which it is left to macerate for a fortnight to twenty days, or until the pulp is quite decomposed. The bundles are then taken out, dried and bleached in the sun.

The fibre obtained by this process is longer than that obtained by scraping, but is not nearly so clean.

A very large suppy of the fibre could be obtained, if a demand for it arose. At present it is sold in the bazar at the rate of 2 annas per lb., but if a regular trade in it were started, the price would doubtless be reduced.

The mean temperature of Coimbatore is 78° ranging between a maximum of 97° and a minimum of 64°. The annual rainfall of Coimbatore is about 21 inches, of which half falls during the north-east monsoon (October to December), the remainder being distributed over the other months of the year.

(Sd). EDGAR THURSTON,
Superintendent, Govt. Central Museum.

Riding Instruction for Dehra Dun Students.

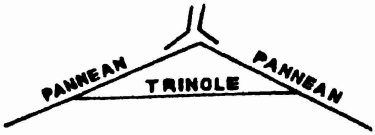
The following Letter has been circulated by the Government of India.

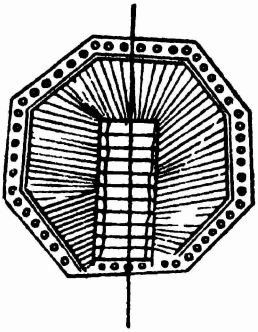
" SIR,

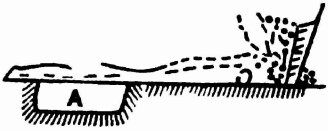
'The Board of Control for the Imperial Forest School at Dehra 'Dun have urged upon the Government of India the desirability of 'arranging for a course of riding-lessons for all students at the 'School, and they have also represented the advantages to be de-'rived by students becoming members of the Dehra Dun Mounted 'Volunteers.

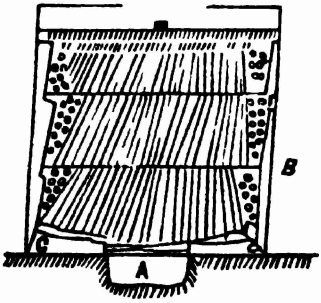
'2. Hitherto only those students who were able to enrol them-'selves as members of the Mounted Rifles have had the advantage 'of instruction in riding, and it is mainly due to the aid given by 'the officers of the Corps and of the School that the necessary 'horses have been forthcoming for these students. There is reason 'to believe that this arrangement cannot be continued much longer 'in consequence of the heavy expense entailed.

THE MOREAU PATTERN CHARCOAL KILN.









3. The Government of India in the Military Department have 'for disposal every year a number of cast-horses which are usually 'sold off in April. It has been suggested that an arrangement 'could be made under which a sufficient number of them could be 'kept at the School for the use of the students from April to 'December, and then sold. It is believed that they would realize 'possibly better prices if sold at that season.

4. It is estimated that 32 horses made available for the eight 'months would cost in feed and keep Rs. 4,000 or Rs. 5,000, and 'the question before Government is whether, with the object of giv-'ing the opportunity to all students to become proficient in riding 'and of encouraging as many as possible of them to become mem-'bers of the Volunteer Corps, and thus to learn riding under a 'system of military discipline, such an expenditure is desirable. 'Before coming to a decision, the Government of India desires to 'learn the views of Local Governments and Administrations on the 'subject, and I am to ask for an early expression of opinion and to 'enquire whether the share of expenditure would be accepted by 'the Local Government as a charge against the provincial forest 'accounts. It would in no province amount to Rs. 1,000 in the year.

5. I am to say that if Local Governments and Administrations 'are in favour of the proposal of the Board of Control, the Govern-'ment of India will take the question under such favourable consi-'deration as they can accord to it."

E. C. BUCK,

Secretary to the Government of India.

The Moreau Pattern Charcoal Kiln.

Description.—The Moreau oven is constructed entirely of sheet iron having the form of a right octagonal prism composed of eight panels 2 M. 50 c/m (8·2 ft.) in height by 1 M. wide (3·28 ft).

These panels are fastened together by means of key bolts which fasten brackets rivetted round the edge of each one of them.

One of these panels is cut into two parts near the middle of its height; this is the "door panel" which facilitates the putting in of the wood. The two perpendicular panels forming the door are reunited by two solid T. irons supporting the four plates constituting the lid of the oven. These plates which rest simply on the T. irons and on the brackets fixed to the top part of the panels leave in the centre a hole about 50 c/m square which is closed with a lid of thin sheet iron provided with a handle; they have besides 4 round holes called "Buses" which are also closed with little plates of sheet iron.

Four of the panels diametrically opposite have on the outside chimneys communicating with the interior of the apparatus through the bottom by means of a rectangular opening.

In the axis of the chimneys are iron rods provided with funnels. The lower extremity of these rods is fixed in pieces of wood forming supports.

At the bottom part of each panel there are two air pipes in the form of funnels. In each of these 16 funnels is placed a globular ball pierced with a conical hole into which penetrates a piece of wood placed in the interior of the oven ; when this branch or piece of wood is carbonized it breaks, the ball falls to the bottom of the funnel thus making an automatical closure.

The closure of the chimneys is worked automatically in the same manner.

Carbonisation.—The carbonisation of the wood by the Moreau process consists of seven operations which must succeed each other in the following order.

1. Preparing the ground.
2. Fixing up the oven.
3. Choice and dimensions of the wood.
4. Filling the oven.
5. Putting in the fire ; heating it.
6. Cleansing and extinguishing.
7. Emptying the oven.

1. *Preparing the ground.*—The ground must be level and on the natural soil, the mole holes must be well stopped up so as to prevent the air from coming in.

A trench must be dug in the centre of the ground occupied by each oven, this trench must be long enough to be able to introduce from the outside the necessary charcoal for lighting it. If, after several bakings, the soil of the ground becomes too dry or too hot it should be watered, or sprinkled with green grass or wet moss, otherwise there is a danger of having very soft charcoal.

2. *Fixing up the Oven*—The apparatus is fixed by means of 16 rods of 50 c/m (of which 8 are at the top and 8 at the bottom). A series of rods serve for setting up all the ovens, these rods are provided with hooks fixing into screw rings rivetted to the panels. The latter are thus kept in their vertical position and in the inclination which they must have one with regard to the other in order to form an octagonal section of a prism ; the junction is completed by means of little key-bolts, the rods are then taken away. The seams must be stopped up with earth as well as possible.

The foot of the oven is surrounded with dry earth as the smoke ought only to come through the chimneys, care must be taken that they are not stopped up. This can be ascertained by passing through them the handle of a shovel and seeing that it goes freely

to the bottom. The little pieces of wood supporting the clappers of the chimneys ought not to be more than 12c/m in height by 3 to 4 c/m in diameter. Those pieces of wood in the balls must be 1 c/m in diameter by the necessary length.

The clappers of the chimneys must enter into them a few centimetres and their plain sides must be laid against the face of the panels.

3. *Choice and dimensions of wood.*—To obtain charcoal of a good quality consistent with a good yield, it is necessary to split the wood more than 6 to 7 (2¾ inches) centimetres of its diameter, and if possible it must not be baked until after it has been felled three months.

Rotten wood must never be used for carbonisation.

4. *Filling the Oven.*—The apparatus having been well cleaned and examined, if the soil be hot and dry a few leaves or some wet moss should be spread over it and once or twice sprinkled with water ; the floor of the oven must then be formed.

Place on the lighting trench a series of pieces of wood and all round pieces slightly inclined and radiating around the centre.

Above the floor, which must be about 15 c/m thick, place the logs of wood starting from the centre and proceeding to the circumference. It is essential to take a special disposition in the conical zone which the wood leaves between the different beds and the walls of the oven in order to allow the products of the condensation, the tar, &c., to flow away and at the same time to allow the gas and fumes to escape.

In order to effect this, place at the back of each panel 6 or 7 pieces of wood of medium size and as straight as possible and fill the intervening space with logs of wood placed horizontally.

The inferior wood must be placed as far as possible in the first row and on the floor.

The first row being finished, the bottom panel door is put into its place. The two other rows must then be arranged : on the top of the last row, place rather damp leaves, moss, or litter, which must be of 8 to 10 c/m in thickness. The T irons are then put into place and on the top the iron sheets forming the roof of the oven.

5. *Putting in the fire : heating it.*—Lighting and heating it ought not to extend beyond 4 hours (by heating it, is meant the heating of the oven from top to bottom). A good heat gives always a good baking.

To succeed in these operations, the fire may be allowed to give a certain intensity of heat at first without fear of evil result. It is well to obtain as much white smoke as possible which must have exit wherever it is produced : yellow, gray or blue smoke must be stopped as soon as produced by progressively closing the manhole and the lighting hole.

Light by means of an iron spoon on which is placed well lighted charcoal, which must be put in as far as the centre, through the lighting trench.

When the fire has well caught, so that the smoke comes out freely through the manhole and the holes called the buses (the chimneys are closed until they are required to draw a little), half close with earth the entrance to the lighting trench only enough to moderate the fire a little, which is soon ascertained by the colour of the smoke. In short, it is necessary to be careful that at the commencement of the operation as much white smoke as possible is produced.

At the end of an hour or an hour and a half, see that the fire is not above nor in the centre ; for this purpose try to push into this place a pole, and if it penetrates this mass, it is certain the fire is above, then make what is known as the covering. For this purpose close quite hermetically the buses, airpipes, and chimneys except the manhole ; by means of a strong pole, enlarge from top to bottom the hole in the centre and fill it with little pieces of wood cut 10 c/m in length, as fast as the hole fills, ram in heavily these little pieces of wood and on the top place a few handfuls of litter and a little coal dust.

This operation must be performed very quickly, it requires each time about a hectolitre of cut wood.

Arrange the oven as it was before the operation and continue the heating by closing progressively the openings, with the exception of the air pipes. If the chimneys can draw, open them with regard to the little buses shut those which smoke yellow grey or blue ; but the one which is on the side of the door, must not be closed more than possible till about 2 hours after heating. If obliged to close it, it should be reopened a short time afterwards.

The cones should not be placed on the chimneys until 15 hours after lighting.

The man hole being closed and the chimneys smoking strongly, which generally happens 1½ hours after lighting, nothing remains open but the chimneys, air pipes, and a part of the lighting hole.

Two and a half hours after lighting the fire arriving at about 25 c/m from the lighting hole, the latter must be entirely closed, but if the smoke should diminish in quantity, it would be necessary to reopen it a little for about an hour.

Four hours after lighting, the oven is heated from top to bottom, all the fissures must be closed with earth and the chimneys filled with earth up to 50 c/m above the soil.

6. *Cleansing and Extinguishing.*

For cleansing, open the man hole, heat down and make even the top of the mass. During the cleansing from time to time, look at the interior so as to put more coal dust on the planes which are too red.

Influence of the removal of humus on the Vegetation of Forests.

(*Translation from the Révue des Eaux et Forêts.*)

It may be interesting to compare with the experiments carried out in the German experimental Forest Stations (vide Vol. XIX Ind For.) a scientific fact which may be found in the records of the Academie des Sciences.

M. M. Berthelot and Schlœsing, Muntz and Condon have made experiments, agreeing with each other, which show that the presence of nitrogen in the soil is exclusively due to the action of micro-organisms, microbes and moulds and that bare soil or soil destitute of organic matter does not fix nitrogen.

In a forest one has frequent opportunities of noticing how the upper layer of mould and dead leaves favours the propagation of moulds and consequently of ammoniacal fermentation. It is then easy to imagine how the removal and even the simple reversing of the layers of dead leaves not only hinders the formation of mould but even diminishes the amount of nitrogen fixed by the soil by preventing the development of micro-organisms.

The influence of the humus on the quantities of nitrogen contained in a soil is already known from experiments recorded by the Eastern Agricultural Station. The results of these experiments are as follows

		Kilogrs of Nitrogen per Hectare.
PROTECTED SOIL		
Upper layer	...	242
Middle „ ...	...	2,110
Lower „ ...	...	6,002
UNPROTECTED SOIL		
Upper layer ...	...	26
Middle „ ...	...	1,073
Lower „ ...	...	3,660

Young trees require more nitrogenous matter than old ones and these latter penetrate deeper into the sub-soil and lower layers which contain more nitrogen than the upper layers. For these two reasons the removal of the covering of dead leaves must necessarily have greater influence in the case of young crops.

This explains certain peculiarities which have often been noticed. For example, in such places as the neighbourhood of houses bordering on or inclosed in the forest, the small areas of coppice which have to bear the exercise of rights appertaining to proximity such as the passing to and fro of the inhabitants and their cattle and carts, invasions of poultry, &c., the same symptoms of languishing vegetation are observable.

in every case it is less vigorous than in the adjoining forest, the stems are smaller, covered with lichens, and with a feeble crown. We have the same phenomena in those parts of the forest which are nearest to villages where grazing is heaviest and this notwithstanding the fact that here as in other parts of the forest grazing is prohibited until the coppice is 10 or 12 years old and that the dead leaves are not removed. It is simply that the surface covering of the soil is constantly being disturbed, kicked up and scattered about by the passing and repassing of men and cattle, and moving about is easy in these crops where the undergrowth is scarce. The result is no rotting or production of moulds, and at the same time little nitrogen and little vigour.

This reminds us of a petition addressed to the Chamber of Deputies about 1884 or 85 by the mayors of the arrondissement of Graz. Among other things the municipalities asked that the coppices might be thrown open to grazing after the age of 5 years, a practice which would carry with it the advantage of cleaning the young crops and destroying the parasites. Perhaps now that the most celebrated chemists of France are on his side, people will now listen more willingly to the Forest Officer when he endeavours to protect these same desirable "parasites."*

L. DETRIC,

* Strictly 'saprophytes' in the Rèvue des Eaux and Forêts.

II.—CORRESPONDENCE.

The law of Property in cases of Erosion.

Sir,

Your correspondent "G. E. M.," in the February number, raises an interesting question as to the law of property in the case of changes created by the shifting of the course of rivers.

Whatever may be the Indian or English law on the subject, I believe I am right in saying that the French law agrees with what he refers to as the "rules in force," the effect being that any extension of a property bordering on a river by reason of a

change of course on the part of the river, becomes a part of that property, while the corresponding area cut off from the property on the opposite side of the river, becomes lost to that property, and, of course, if the river goes back again, the properties return respectively to their original areas.

Supposing this to be the law, its result is clear enough so long as only a portion of any particular property is cut off. As to the particular cases he cites, in which the whole of a property is cut off, I cannot say what the position would be on the return of the river to its original course. However, I would suggest the following as the course the ousted proprietor might take.

It may be supposed that the principle applies only to properties which border the river, and so, that claim to accretion can be only on the ground that the river is the boundary of the property. Then it would follow that the owner of a property not originally extending to the river, but which, on the river changing its course, actually touches it, would have no ground for saying, when the river returned to its original course, that the reverse accretion belonged to him, for that would be tantamount to alleging that the river was the boundary of his property. If then he took possession of such accretion, the ousted proprietor could dispute such possesion and call upon the interloper to establish his right. It would then appear that the river was not the boundary of his property, (but some other line which could be determined) and consequently (unless, of course, a question of prescription came in) that he had no title to the property that existed before the river shifted.

There would then be nothing to prevent the ousted proprietor resuming possession.

The fact of title to such property, consisting of a notification under the Forest Act, seems to be beside the question, in fact the law on the subject would be general and not dependent upon the nature of the property or of the proprietor's title, and in the case of a Reserved Forest, there would be nothing to be done but to alter its area in the Departmental records (keeping it still on the list, though the area came down to zero) indeed, if the original notification were modified, as your correspondent implies ought to be done, any portion cut off would be practically disafforested and would be left without a definite owner on the river retiring, and this would necessitate a Settlement before it could be treated as Reserved Forest again.

In regard to the 'centre of the earth' theory, is not that merely a subsidiary principle in the regulation of the rights of property, applicable only when the proprietor is in possession of the surface to begin with?

P. and P.

Age of Indian Forest Trees.

SIR,

I have searched several books without being able to find much about the longevity and age of maturity of Indian trees.

Can you enlighten me with regard to the following?

Acacia Sundra.
Hardwickia binata.
Chloroxylon Swietenia.
Anogeissus latifolia.
Borassus flabelliformis.

With regard to the latter, I hear that in one district the age of maturity is considered to be 50 years, and the forest is being treated on a 50 years rotation; local enquiry, however, seems to declare 75 to be the age of maturity.

But another question that I wish to ask is how are you to know whether a palmyra is 50, 60 or 75 years of age: the natives here say that the wood is harder and better at that age, but is there any real means of proving the age?

It has been suggested that the leaves sprout periodically, and that by the number of scars in a straight line up the trunk you can tell the age. Is this so? And to what period do the scars tally?

A. W. LUSHINGTON.

Percentage of Higher forest appointments in Bombay

SIR,

I wonder no one else has thought it necessary to address you on this subject. A glance at the latest Bombay Civil List discloses the fact that there are in all 31 appointments in the Imperial Service of the Bombay Presidency, including Sind, and only *two* with salaries of Rs. 1,000 per mensem and over.

This shows a percentage of plums at 6 50. Comparing the P. W. D., it is found, there are 89 appointments and 26 carrying with them salaries of Rs. 1,000 and over: (there are two appointments of over Rs. 2,000) making the percentage of plums at 29·21. Why should there be this glaring difference? Is it not necessary that something should be done to remedy the present unsatisfactory state of things? There does not exist that *esprit de corps* in the Forest which prevails in the P. W. D., a want which, it is feared, will damage the interests of the former very

Progress Report of Forest Conservancy in Ceylon for 1892

"*Forest Conservancy in Ceylon* does not appear to progress as smoothly as might be wished and the Report for 1892 by Mr. Broun, who was permanently appointed just before the commencement of the year to the post of Conservator of Forests, indicates that there is much opposition and many difficulties to be overcome before the forests of that colony can be properly administered. The co-operation and sympathy of the Government Agents are, we doubt not, as necessary for successful Forest Administration in Ceylon as is the case in India, and we trust that succeeding reports will have a more favourable account to give in this respect, at any rate as regards one or two of the provinces in which the relations between the departments appear to leave much to be wished for.

The total area of Reserved Forest at the commencement of the year was 23,473 acres. The reservation of areas is still going on but the progress during the year is reported to be unsatisfactory, only some 19 square miles having been finally proclaimed during that time, so that the total area at the close of the year stood at 35,503 acres. In this matter the Conservator complains that as regards reservations in the Sabaragamuwa Province, he is never consulted, and only receives his information from the Government Gazette.

In the preparation of Working Plans there is not very much to record, though a commencement has been made by Mr. Hansard who has been employed during the year in framing a plan for a portion of the forests along the Nanu-oya extension, which it is proposed to work by compartments in alternate strips running at right angles to the prevailing winds and varying in width according to exposure. Some of the measurements taken in the sample plots may be interesting and are therefore appended.

"*North-Central Province.*—Of three sample plots selected in '1889 and 1891, two have been re-measured, but I fear that the '*data* obtained will not be of very great use, the first sample plot 'consisting, not of one compact block of trees, but of clusters of 'trees selected here and there, and not only of indigenous trees, 'but also of exotics planted at different places about Anurádhapura. 'The record is nevertheless interesting, as the following measure-'ments will show :—

No. of Trees measured.	Species.	Average Girth. 1860.	Average Girth. 1893.	Mean Girth Increment.	Mean Annual Girth Increment.
		Inches.	Inches.	Inches.	Inches.
8	Teak	7 87	19 37	11·50	3·83
11	Spathodea	24·00	49·09	25·09	8·36
4	Grevillea	6·75	13·75	7·00	2·33
1	Mora (*Nephelium Longana*)	4 50	9 00	4·50	1·50
32	Satin*	26·75	30·31	3·56	1·15
4	Milla (*Vitex altissima*) ...	10·50	12·50	2·00	0·67
27	Halmilla (*Berrya ammonilla*)	21 50	21·70	3·90	1·07
3	Flamboyant (*Poinciana regia*)	21·66	38·00	6·34	2·11
1	Ranai (*Persia semecarpifolia*	38·75	40·75	2·00	0·67

'The exotics are evidently better growers than the indigenous 'trees, but the slow growth of the latter may be due to the shock 'which they may have experienced owing to their sudden isola-'tion.

'The other sample plot, which the Assistant Conservator calls 'the Nuwarawewa plot, is, according to him, an unfortunate selec-'tion, as it is irrigable land under the tank, and is bound to be 'sold sooner or latter. An interesting experiment was made here 'in order to ascertain the difference in growth of halmilla in 'cleared and uncleared land :—

'CLEARED PORTION.

No. of Trees measured.	Species.	Average Girth. 1890.	Average Girth. 1893.	Mean Girth Increment.	Mean Annual Girth Increment.
		Inches.	Inches.	Inches.	Inches.
244	Halmilla ...	10 13	12·06	1·93	0·64
3	Ranai ...	24 00	29 00	5·00	1·67
1	Ebony ...	6·50	8·50	2·00	0·67

UNCLEARED PORTION.

No. of Trees measured.	Species.	Average Growth. 1890.	Average Growth. 1893.	Mean Girth Increment.	Mean Annual Girth Increment.
		Inches.	Inches.	Inches.	Inches.
77	Halmilla ...	9 32	13·24	3·92	1·31
1	Ebony ...	4·00	6·50	2·50	0·83

'Thus, halmilla in the uncleared portion has grown at a quicker 'rate than the trees which have been suddenly exposed to sun and 'wind."

Another sample plot in the Kulugalla Forest shows a mean girth increment of ¼ inch for *Mischodon zeylanicus* and ½ inch for *Mimusops hexandra*.

The following extracts under the head of artificial reproduction are given as they contain interesting information regarding the results of planting in Ceylon.

"In the Nuwara Eliya plantations the blue gums planted in '1888 average 17 in. in girth and 40 ft. in height, and the *Cryp-'tomeria* of the same age 6·67 in. in girth and 14 ft. in height in

'the kachchéri clearing, while in the nursery clearing the blue 'gums of 1888 only average 12·04 in. in girth and 28 ft. in height. 'In this clearing the average girth of *Acacia melanoxylon* of the 'same age is 6·25, and the average height 20 ft., while *Acacia* '*decurrens*, also of the same age, attains an average girth of 23·67 'in. and a height of 40 ft. The *Eucalyptus robusta* planted in 1891 'has not done quite so well as at Nánu-oya, as it averages only '4·62 in. in girth and 14 ft. in height. These plantations are 'getting on very nicely, but are somewhat expensive, as the area 'added during the year and the upkeep of former plantations cost 'upwards of Rs. 73 per acre. In the North-Western Province 'all the plantations are doing well, except the portion which was 'taken up at Puttalam for teak. The plantation of teak and jak at 'Kumbalpola 10 acres in extent is doing well and has only cost 'Rs. 525 in three years, while that of Sundapola, which is equally 'successful, and which now covers 89 acres, has cost less than 'Rs. 3,000. This plantation is chiefly of teak and jak, but also 'contains other species, such as satin, margosa, and the large-'leaved mahogany, while the place is full of self-sown seedlings 'of lunumidela (*Melia dubia*) and also of jak, for the forest con-'tains a number of wild jak trees. The plants are put in partly 'in well-cleared strips and partly under shelter of the forest, 'which has, however, been considerably thinned. It will however 'be necessary to make further thinnings, as the young plants are 'growing far too lanky and spindly. I think these would benefit 'by being topped."

In the Eastern Province the Teak chenas have not been a success. Most of them consist of sheets of illuk grass with scattered teak poles and the granting of these chenas has been discontinued. The efforts of the Department should in future be directed to the proper stocking of these areas with Teak or other quickly growing trees which can fight successfully with the invading grass.

Small improvement fellings are reported to have been made here and there but without system. The Conservator complains of the want of zeal on the part of his Assistant Conservators in this respect and comments on the fallacious idea which seems to be more or less prevalent that improvement fellings should not be undertaken unless they can be made to pay.

From remarks of this nature occurring in various parts of the Report we are led to suspect that the obstacles in the way of proper forest management in Ceylon are not only those which are met with from without, but that the want of zeal and due understanding of the object and importance of forest works on the part of some of the members of the department are equally or even more obstructive to the progress of Forest Conservancy.

In addition to 2,413 cubic feet of timber chiefly Satin wood and 7½ cwt. of ebony supplied direct from the Central Depôt, 18,800 cubic feet of timber were supplied from the provinces to

be sent to the Chicago Exhibition. The amount applied for by the Commissioner in charge of this work appears to have been double the quantity actually required, the value of the royalty of the timber supplied being estimated at Rs. 9,000.

The financial results show a considerable improvement on those of last year the deficit which in 1891 was Rs. 31,170, having been reduced to Rs. 13,178. The outstandings due to the department are, however, very much larger than last year and those due by the department at the close of the year very much less, so that on the whole the results are not unsatisfactory and the improvement is certainly considerable.

Forest Administration in Jodhpur, 1892-93.

In our July number, 1893, we gave an account of the results of forest work in Jodhpur for 1891-92 and were able to record fairly good progress. The present Report seems to indicate some falling off, both financially and in protection. The whole Jodhpur Range 9,240 acres is struck off the list as "transferred to the Shikarkhana Department" which we suppose means that it has been formed into a private shooting preserve. As the Jodhpur Range gave most of the revenue, it is not surprising that the year's financial results shew a deficit.

Fire protection was fairly successful as only 940 acres out of 181,760 were burnt. Natural reproduction is reported as very satisfactory, as is the growth of coppice shoots and seedlings.

The former forest officer Lala Daulat Ram Bhimbhat was transferred to the Punjab and succeeded by Pandit Gokal Dás, a Ranger from the same Province.

Mineral Production in India for 1892.

This is an interesting return with some important statistics. The chief minerals treated are salt, coal, iron and petroleum and the following was the out-turn of each for 1892.

	Tons.		Rs.		
Salt	8,98,909	valued at	5,382,845	chiefly from	Madras and Bombay
Coal	2,537,696	" "	8,357,052	" "	Bengal
Iron ores	23,161	" "	2,63,114	" "	Central India
	Gallons.				
Petroleum	8,725,331	" "	3,76,592	" "	Burma

Among other minerals the chief, of course, is gold, and of this 163,187 oz. valued at 9,896,021 rupees were produced in Mysore with smaller amounts in other provinces and states. Some few minerals are treated as forest produce we see and the chief of these is mica of which Bengal turned out 120 tons valued at Rs. 98,154 the amount and value of the exports of the year having been 166 tons valued at Rs. 4,34,348!

Soapstone is worked as a forest product in Madras and there is said also to be excellent stone in Upper Burma. Corundum is another article of forest trade in Madras, and antimony mines are leased by the District Forest Officer of Jhelum in the Punjab.

'Mineral Paint' of a 'slatish' colour is found in a vein on the Kishengarh Hill in Rajputana and has been found a good substance for painting wagons, iron-work and ships, and as such has been used by the Rajputana-Malwa Railway.

Indian Railways Report for 1892-93.

As usual, this Report, profusely illustrated by excellent maps, is very interesting and instructive. As regards its bearing on forest work, however, the only part of special interest is the Chapter on Fuel consumption. The statistics for 1892 give

Coal, English	204,603	tons
„ Indian	875,996	„
Coke	9,496	„
Patent fuel	4,139	„
Wood	300,682	„

The North-Western Railway procured its wood fuel partly from the Bahawalpur state forests at Rs. 45 per 1000 cubic feet; partly from the Sind forests at Rs. 34 to Rs. 44 per 1000 cubic feet; partly from the Punjab forests at Rs. 50 to Rs. 57 per 1000 cubic feet.

The Madras Railway obtained its firewood at rates which varied from Rs. 3-6-0 to Rs. 7 per ton.

On the Southern Mahratta Railway, Kánara firewood was used at the rate of Rs. 4-4-0 per ton paid to the Bombay Forest Department; Mysore firewood at Rs. 6-2-8 per ton.

The firewood used on the Burma State Railway cost Rs. 7-2-0 per 100 cubic feet.

We regret to have failed to find any account of the comparative cost and comparative durability of the various kind of sleepers, wood and iron, in use.

VI.—EXTRACTS, NOTES AND QUERIES.

Sal-leaf blight in the Dun.

Last autumn a blight was found on the leaves of the Sál (*Shorsa robusta*) trees in the Dún forests by Mr. A. Smythies, Deputy Director of the Forest School. It took the form of sooty black felt-like patches on the leaves and as it was sufficiently common to be probably able to retard growth, specimens were sent to Dr. D. D. Cunningham, C.I.E., F.R.S., in Calcutta, who was kind enough to examine it and whose report is as follows :—

"The Sal blight is due to one of the so-called black mildews—'a *Perisporiaceous* fungus certainly very close to *Meliola* or *Antenaria*. Its mycelium is purely superficial, so that any damage 'which it causes must be dependent on the thick crusts interfering 'with transpiration. It will not be easy to contend with, as it has 'such abundant and varied means of propagation. The first fructification which appears is a simple conical cone borne on the 'threads of the thallus. Subsequently *Perithecia* and *Pycnidia* appear 'in large numbers, long, slender, curved, uniseptate, almost colorless 'ascospores, and the latter filled with huge deep brown, uniseptate 'conidia, which, I should imagine, represent resting spores, as they 'possess characters implying much greater resistance and persistence than the free conidia or ascospores do.

'Beyond burning the fallen leaves covered by the masses of 'such resting fructification, I do not see what can be done to check 'the extension of the blight."

It is probably the same, or closely allied to, one which was found in the Oudh forests in 1892 by Pandit Keshavanand, Extra Assistant Conservator of Forests.

Firewood Splitting Machinery for the Colonies and Abroad.

In many parts of the world, where wood is cheap and plentiful and coal scarce and expensive, the former has to take the place of the latter as fuel for manufacturing and general purposes. The preparation of "firewood billets" in such countries must therefore, as a matter of course, constitute a very large and important industry. Anything, consequently, that will tend in these days of keen competition and small profits to cheapen the production of this indispensable article by the aid and means of cheap and effective

machinery, will doubtless be received with the consideration it deserves by manufacturers, railway and steamship companies, planters, and others, who find themselves obliged to have this kind of fuel.

From a careful examination made of the annual trade reports of the British Colonies, Consular reports, and from other reliable sources, it is found that firewood is used in enormous quantities in South America, including Brazil, Chili, Paraguay, the Argentine, Venezuela, Peru, Mexico, &c., for railways, river and coasting steamers, cattle ranches, brick and tile works, tanning factories, mines, &c.; in British and further India, including Assam, Burmah, and Ceylon, for railways, river steamers, tea and coffee estates, brick and tile works, rice mills, &c.; in the Far East including the Straits Settlements, Johore, B. N. Borneo, Siam, Saigon, Sumatra, Java, &c, for railways, steamers, sago and tapioca and sugar factories, brick works, rice mills, &c. The following countries also use wood fuel in large quantities: South and East Africa, the Zambesi, West Coast of Africa, the Congo Free State, Senegal, West Indies, &c. As an example it may be mentioned that the Indian railways alone used in 1892, 300,682 tons.

Mr. Fred. Boultbee, of Messrs. A. Yates & Co., Luddenden, *via* Manchester, who has had great experience in the East as a sawmill engineer, has for a long time given this important question much consideration, and the firm in question have, through the experience gained by him abroad, and experiments made, invented, patented, and are now prepared to supply machinery and plant for dealing with any kind or class of wood, no matter how hard, refractory, crossgrained or knotty, and converting the same into "billets" of any required size suitable for fuel.

The methods adopted at present in the East and in fact all over the world, for splitting up "mangrove," and other woods suitable for fuel into "billets," may be briefly described as primitive, costly, and unsatisfactory; heavy, long-pointed axes and wedges being employed to break open the logs and split them up into suitable sized pieces, and with the present means and appliances, it is found impossible to deal with trees of more than 9 in. diameter, and only those, moreover, that are straight grained and free from knots are selected for the purpose; the consequence is that the largest and most matured trees which, of course, make the best fuel, are left and as the coasts, rivers, creeks, swamps, and lakes of all tropical countries are deeply fringed with belts of "ever-spreading prolific Mangrove" (*Rhizophora Mangle*), in most cases several miles deep, containing millions almost countless of trees only fit for fuel, some idea may be formed of the quality left by Messrs. A. Yates & Co.'s machinery.

Given an inexhaustible supply of "mangrove" and other timbers fit for nothing else but fuel, these territories undoubtedly afford a splendid and vast field for the establishment of firewood factories," fitted up with suitable machinery and plant for the rapid and economical conversion of this waste material into "billets"

for fuel, and industries of this nature would form quite a new departure in the annals of woodworking machinery, and must certainly prove a lucrative business to the introducers thereof, besides stimulating and encouraging local industry, as the natives could be employed and would only be too glad to make contracts with the proprietors of the factories to keep them supplied, at a very cheap rate, with mangrove trees, which at present, for the reason given, they are unable to split up by the primitive means they have at their disposal. Briefly, "firewood splitting up machinery" would play the same part as the "saw-mill" now does, compared with the days when beams, planks, and scantlings were sawn up by hand.

The machines employed by Messrs A. Yates & Co. for this purpose are strong, simple, cheap; require but small power to drive, need no heavy and expensive foundations on which to work, can be worked by unskilled labour, cannot well get out of order, and will deal with every description of timber of any diameter, no matter how hard, refractory, crossgrained, or knotty, and convert the same into "billets" of any required size. The machinery, briefly, consists of a log-splitter, and which can be worked by hand or power. This "breaks down" the log, after it has been cross-cut to any required lengths, into suitable-sized segments; these latter are then dealt with by the "billet machines," which split them up into pieces of any required size ready for use. Thus Messrs, A. Yates & Co's "firewood billet machines," working in connection with one of their "log-breaking-down machines," improved cross-cut saw, and driven by a small vertical or portable engine, constitutes a complete firewood factory. In addition to complete firewood splitting-up installations for turning out any required number of "billets" per day, the firm also supply special plants for fixing up on barges, lighters, and flats, with light draught, for taking up shallow rivers, creeks, &c. (*Timber Trades Journal.*)

Imperial Forest School Dehra.

THE PRIZE DAY.

The annual distribution of certificates and prizes awarded to students during the past year was held at 4 P. M. in the drawing hall of the Forest School, on Saturday, the 31st March last. Some of the best maps and drawings done by the students who were leaving were displayed on the walls, while the pick of the collections of plants and entomological specimens were laid out in the library and museum for the inspection of the visitors. The following Forest Officers were present: The Inspector-General of Forests, Mr. B. Ribbentrop, C. I.E. Messrs. Hill and Oliver, Conservators of Forests; the school staff, consisting of Mr. Gamble,

the Director; Mr. Smythies, the Deputy Director; Messrs. Gradon and Rogers, Instructors; Mr. Grentell, Deputy Conservator of Forests, Saharanpur Division, and Mr. Billson, who has lately joined the Direction from Coopers Hill. Mr. Duthie, Director of the Botanical Department, Northern India, represented the non-resident Professors. The vernacular instructor, Babu U N. Kanjilal, and Pandit Sadanand, a passed student of the school, and now in charge of the Dun Division, were also present.

The Gurkhas were represented by Colonel Begbie and Captain Macintyre: the Forest Department by Mrs. Smythies and Mrs. Gradon: the planters by Mr. and Mrs. Hodges, Messrs. Armstrong and Litchfield. A number of other ladies and gentlemen of the station were also present.

The Director began the proceedings by reading a report on the work of the school: he stated that the year had been an uneventful one, and that he was glad of it, as there was nothing so good for the progress of an educational institution as a few years of quiet work without changes in the teaching staff. He then alluded to the new students' quarters, which were commenced about a year ago, and are now approaching completion, expressing the hope that when ready for occupation they would help to lessen still further the expenses of students, and he stated that if the long deferred sanction, which was expected from England, to the recognisation of the Provincial Service, were received, he expected it would be difficult to provide for the increase in the numbers of students which would as a natural consequence follow.

The number of students who were leaving the school, he said, with certificates, was the largest on record. Sixty-one students, fifty in the upper and eleven in the lower class, had entered the school in July 1892. One of these had to leave through illness, and another, Charles C. Vieyra, had died of consumption while at the school. Vieyra was a great favourite among the students, and he was sure that he expressed the feelings of both staff and students when he said that all regretted the sad incident which had prevented his name appearing among those of the successful students that day. Of the fifty-nine students that had gone through the whole course, fifty-two had been granted certificates, which represented a very good percentage. Three students were granted "honours" certificates, another source for congratulation, as in the two preceding years no student had gained that distinction. The total number of students in the school is 106. Next year he anticipated a small falling off in the number of students: this would be temporary only, and be probably due to the fact that the Home authorities had not yet recognised, as the Government of India had so fully done, the necessity of increasing and improving the executive staff of the department. He then announced the winners of medals and special prizes, all of whom were loudly applauded as their names were read out. There were no medals granted

for Forest Engineering and Botany, as no student had done sufficiently well in either of these subjects. Corbett obtained the medal for Sylviculture ; the Inspector-General's prize for the best essay on a sylvicultural subject ; Mr. Smythies' prize for the best in Practical Forestry, and the second prize for notebooks kept on tour. The medals for Utilisation and Working Plans and Forest Law were awarded to Syed Burhan-ud-din. Two students were equal in surveying, namely R. E. Hannah and Gurbuksh Rai, both of whom received medals. The medal for the best herbarium fell to Ram Swarup, and the Director's prize for the second best herbarium to Maung Aung Thu. The medal for Forest Mathematics was given to Panchipikesa Iyer, as was also the Campbell-Walker's prize for the best Madras student in Forestry, and Mr. Moir's prize for the best student in Forestry in the whole school. The Director's prize for the best entomological collection was awarded to J. F. L. Tweedie. The medals awarded to the lower class were given to Durga Dutt and Mahomed Yasin.

The Director then stated that the present class had as much excelled in games and athletics generally as they had in their studies. Langhorne, R. Pocock, Tweedie and Chinniah were conspicuous at the athletic sports, while Tweedie and Corbett were the mainstay of the cricket eleven. Tweedie had twice made over 100 runs, and the Cricket Club were presenting him with a bat in recognition of these achievements. He then referred to the good work done by the Mounted Rifles under the command of Major Leslie Rogers, and regretted that the Commissioner of the Division, Mr. Harington, who also evinced the greatest interest in volunteering and in the school, though in the station yesterday, was unable to stay for the distribution of the certificates.

The Director then referred to the drill of the native students and thanked Colonel Begbie, of the 2nd Gurkhas, the Officer Commanding the Station, for the assistance of his havildars, and other acts which showed his interest in the school. He then acknowledged the services of the school staff and the way in which they had supported him in all school work, and proceeded to congratulate the Deputy Director, Mr. Smythies, on his promotion to the rank of Conservator, to regret his departure from the scene of many years of patient labour, to offer him on behalf of the staff and the students every good wish for success and prosperity in his future career, and then expressed the hope that he might some day return to Dehra as a member of the Board of Control He then proceeded to welcome the new Deputy Director, Dr. Nisbet, who, he informed his audience, had not only an Indian but a European reputation as a forester of learning and experience, and he was sure that under him the teaching of Forestry would continue to maintain its present position in the school. The Director then expressed his thanks to Messrs. Reynolds and Duthie and Major Bingham for their kind help as examiners, to Messrs. Cotes and

Collins as teachers, and to the staff of the school circle, Messrs. Moir, Hearle, Grenfell and Billson, for their assistance in the class room and on tour. Finally, he expressed his sympathy with the members of the Board of Control, Mr. Ribbentrop, Messrs. Hill, McKee, Oliver and Reynolds, who had all suffered from that most unpleasant enemy influenza, and hoped that they might soon recover their usual good health. Finally, he concluded by saying good-bye to the students, and expressed a hope that the ymight distinguish themselves and never forget their old school.

Mr. Ribbentrop then rose to address the students before distributing the certificates and prizes. He was recovering from an attack of influenza and in a humourous speech begged indulgence from his audience on behalf of himself and the Board of Control, who, he said, ought to be in bed if they were not actually there. He then added that he had intended merely to tender an apology for the Board of Control, but that the encouraging words of the Director, and the favourable report, had given him sufficient confidence to say a few words more. He thanked the audience for the sympathy they had extended to the institution which had grown up in their midst, and trusted that they would give him some "grace-marks" in case he required them at any period of his speech. The Inspector-General continued by informing his audience of the sad condition in which the demon influenza had left the Board of Control, he said that he had no sooner appointed a new man to strengthen the board than he also was attacked by the same disease, but that in spite of their crippled condition they had striven to do their work conscientiously, and had succeeded in doing so. The present year would, he said, be known not only as the year of influenza, but the year of honours. No fewer than three students had achieved that distinction, and he maintained that it was no mere coincidence that the three first men represented the three chief races and religions of the Indian Empire, the Hindu, the Christian and the Muhammedan (applause); that it indicated the direction in which the general educational policy of the Government of India was progressing; that it was a real indication, which he considered a matter of congratulation, especially in these days when unscrupulous persons are trying once more to fan the dying embers of race antagonism and religious fanaticism into flame. (Renewed applause.) Mr. Ribbentrop then said that it was most satisfactory to note the constantly increasing proficiency in sylviculture and other branches of forestry; he stated that in these subjects the examiners could most easily sift cram from true knowledge, that they had done so carefully, and that the result was most creditable to the school staff and the students. He then added that the greatest credit was due to the teacher of the direct branches of forestry, Mr. Smythies, who had gradually developed his lectures to their present standard of excellency; he continued by

saying that Mr. Smythies was leaving Dehra, and humorously called upon the students to give three hearty cheers for Mr. Smythies, the sylviculturist. This was heartily responded to by the students, and when quiet was once more restored, he twitted the students on their vocal powers, and called upon them to give three cheers for Mr. Smythies, the Captain of the Mounted Rifles, assuring the audience that he was one of the mainstays of volunteering in Dehra. He evoked much laughter by alluding to the parade which had been held under the command of Captain Smythies a few days previously. The cheers called for were lustily given, and while they were continued Mr. Ribbentrop sat down, only to rise once more and express the wish that the students who were leaving would work in the Forest as hard and as conscientiously as they had at the school, that they would maintain an *esprit de corps* among themselves and always remember their old school with affection.

The certificates and prizes were then distributed by Mrs. Smythies, at the request of the Inspector-General of Forests. The honour-men: Panchipikesa Iyer, Syed Burhan-ud-din and Corbett were loudly applauded by their fellow-students. After this part of the function was over, a cricket bat was presented by Mrs. Smythies to Tweedie, for the scores of 102, not out, and 100 which he had made against two Mussoorie schools last year. The students then called upon Mr. Smythies for a speech, and he briefly responded by expressing his sorrow at leaving the school, and also the hope that the junior students would pass as brilliant an examination as the present seniors had. He was again called upon as Captain Smythies to make a speech, and said that he wished to say good-bye to his Volunteer comrades, and was sure that the corps would continue to flourish under Major L. Rogers and Lieutenant G. Rogers, who, he hoped, would be elected as Captain in his stead. (Applause.)

The Director then called upon the students to give three cheers for the Board of Control and the ladies; cheers were then given for the school staff and Mrs. Smythies, and with these the proceedings terminated.

An account of the distribution of certificates would be incomplete if no reference were made to the condition of the school museum, herbarium and grounds. The Director has devoted a large portion of his time to the arrangement of the museum and herbarium, and their present excellent condition is due to his personal exertion and ever watchful superintendence. The grounds and park have everywhere evidence of his skill and good taste, while the numerous rare plants and trees which are gradually being introduced will, in a few years, be a living testimony of his work as a lover of nature and his skill as a landscape gardener. The Forest Ranger, Birbal, has always ably carried out Mr. Gamble's instructions, and great credit is due to him also for the well kept condition of the school grounds.—(*Pioneer.*)

VII-TIMBER AND PRODUCE TRADE.

Extract from report on the trade of Bangkok for the year 1891.

Teak.

There had been expectations of large supplies of teak after the rainy season had set in. Some merchants had made heavy engagements on these hopes, and consequently experienced much difficulty in finding cargo for the ships they had chartered. The total export of 1891 amounted to 16,100 tons, in comparison with 38,735 tons in 1890. Local prices ruled high, the average price of squares and planks being from £6 to £7 per ton. Of the amount exported, 5,398 tons were shipped to Europe, 4,741 tons to Hong Kong, 3,770 tons to Bombay, and 1,335 tons to Singapore. All other articles of export show a decided decrease in quantity and value excepting woods other than teak (rose, iron, padoo, ebony and sapan wood), which have increased in value from £22,960 to £32,720, and buffalo hides and cardamums, which have also slightly increased.

Return of principal articles of export from Bangkok during the years 1890-91.

Articles.		1891.		1890.	
		Quantity.	Value.	Quantity.	Value.
			Rs.		Rs.
Teak ...	Tons.	16,100	75,207	38 735	2,00,178
Woods other than teak ...	"	7,100	32,720	4,238	22,960
Cardamums ...	"	224	15,834	155	14,223

Extract from a Report for the year 1891 on the trade of Chiengmai in Siam.

Bad season for teak.

Teak merchants say that the past season was the worst for their work since 1885.

British share.

An important feature in the two most valuable branches of trade, *viz.* cotton manufactures and teak, is the increased share taken in them by British firms and their Agents, who are gradually excluding native and other traders, as far as the business with Bangkok is concerned. The Maulmain trade still remains in the hands of Asiatics.

Exports, Teak.

The number of logs of teak which arrived at Chainat (the duty station on the Mënam) during 1890 was, roughly speaking, 9,500, of which about 7,000 came from the Më Ping (Chiengmai River), 1,501 from the Më Wang (Lakhon River), and 1,000 from the Më Yom (Phrë River).

Deliveries at Chainat for the last four years.

The following is an approximate estimate of the arrivals of logs from this district at Chainat for the last four years :—

	Logs.
1888	63,000
1889	60,000
1890	30,000
1891	9,500

1891 delivery.

The delivery of last year was, therefore, about 41,500 logs below the average for the preceding three years. This was due to the deficient rainfall in 1890 being followed by a still more scanty one in 1891. Had the season been favorable, the delivery would have been up to the average, and it is expected that with ordinary good waters

Delivery expected.

the delivery in the coming season from the Më Ling and the Më Wang alone will be 30,000 logs, and with high floods 50,000 logs.

Output from Salween forests.

To estimate fully the export of teak from the district, the output from the Chiengmai forests on the Salween must be added to the arrivals at Chainat. The number of logs from Chiengmai which arrived at the Maulmain duty station in 1891 was 43,873 logs being 18,244 logs less than in 1890.

Small logs.

Only small logs appear to be floated down to the Nau River at present, but the forests drained by this river are not very extensively worked as yet. I do not think the rapids are impossible for large logs, but the Nau people, who work their forests themselves as a rule, are said to have some superstition against felling the large teak trees.

The effect of the indiscriminate working and absence of conservancy is beginning to be very evident in the teak forests of Chiengmai and Lakhon. Teak saplings are cut down in large numbers for house posts and even for making fences, and the clause in the leases forbidding the felling of small trees is disregarded. The consequence is that in Chengmai there is reason to fear that in five years' time the only teak left will be that which is too far from the water to be profitably worked, and in Lakhon the foresters complain that all the best trees have already been felled.

Indiscriminate working.

Teak becoming scarce in Chiengmai and Lakhon.

The general opinion of teak merchants and foresters here appears to be that there are large quantities of teak in the valley of the Më Kong and that it could be floated down that river to Saigon, but none has yet reached that part as far as I am aware.

Teak in the Më Kong Valley.

The merchants who work teak in the Më Yom complain very much of the timber stealing which goes on at Sawankalôk, the rafting station on that river. The stolen logs are often fired with kerosene to deface the hammer marks of the owners. The authorities do not appear to do much to keep the thieves in check.

Timber thieves.

The present system of granting forest leases for three years only is very prejudicial to the interests of forests. In many cases the leases are renewed when they expire, but a forester who is not fortunate enough to secure a renewal of his lease may find that at the end of three years, his logs are still lying in the forest, as it takes at least three years, generally much longer, from the time a teak tree is girdled, to fell the tree, lop off the branches, and drag and float the log out of the forest, and if the wording of the lease is strictly adhered to, all logs lying in the forest and girdled trees become the property of the owner of the forest as soon as the lease expires.

System of granting forest leases.

Under these circumstances, a forester taking up a new lease, is not likely to girdle many fresh trees, but will only fell the trees already girdled, and the lease being granted for such a short period, he is not encouraged to make a large outlay of capital and labour in the first.

Previous to the year 1888 the leases granted to British subjects were generally for a term of six years, but in that year the time was reduced to three years. This change was due, I think, to the action of the Siamese Commissioner, by whom forest leases are ratified.

The greater part of the capital with which the teak trade of the district is carried on is British, and there are now three British firms engaged in the trade which have branches in Chiengmai or Lakhon; the

British capital.

Bombay-Burma Trading Corporation having established a branch at Lakhon in 1891. The Chiengmai forests on the Salween side are worked almost entirely with British Indian capital brought from Maulmain.

Squared logs to be sent to Bangkok.

Some squared logs of teak are this year to be sent from Chiengmai to Bangkok as an experiment. The logs are roughly squared in the forest before being put into the river, the advantages of sending such squared logs being that there is less weight to be dragged to water, payment of duty on the valueless part of the log is avoided and the logs obtained are all sound.

Axes used.

The axes used for felling teak have an iron head measuring 10 inches by 2 inches. The axe heads were, until recently, all of native manufacture, but now some of them are imported from England.

Bamboo seed is eagerly sought for and is sold at a high price, sometimes two-thirds the price of rice.

Return of principal articles of export from Chiengmai to Maulmain during the years 1890 and 91.

Articles.		1891.	1890.
		Quantity.	Quantity.
Teak ...	Logs.	43,873	62,117

Churchill and Sim's Circular,

March 5th, 1894.

EAST INDIA TEAK.—The deliveries since the beginning of the year have amounted to 2,534 loads against 1,401 loads for the first two months of 1893. For February alone this year they have been as much as 2,109 loads against only 773 loads in February 1893. Prices for Wood in the Docks have been firm, with an upward tendency. Floating cargoes near at hand have been difficult to place to advantage, but rather better rates are obtainable for cargoes to come in a little later on. The requirements of British and Foreign Governments will absorb so large a proportion of the shipments, that any improvement in the general demand, which, however, is so far quite invisible, would reveal a scarcity.

ROSEWOOD.—Unsold stocks are light but demand dull.

SATINWOOD.—*Logs*, if figuary and of good sizes, sell well, but for plain wood there is very little enquiry.

EBONY.—There is more enquiry, and prices have a better tendency.

PRICE CURRENT.

Indian Teak	per load	£9-10s.	to	£16-0
Satinwood	per superfical ft.	£0-6d	to	£0-12d.
Rosewood	" ton	£5.	to	£8
Ebony	"	£6.	to	£8

MARKET RATES OF PRODUCTS.

(*Tropical Agriculturist, February 1894.*)

Cardamoms,	per lb.	2s.	to	2s.6d.
Croton seeds	per cwt.	20s.	to	27s.6d.
Cutch	"	20s.	to	32s.
Gum Arabic, Madras	"	40s.	to	52s.6d.
Gum Kino	"	£15	to	£18.
India Rubber, Assam	per lb.	1s.7d.	to	2s.3d.
" Burma	"	1s.7d.	to	1s.11d.
Myrabolams, Bombay	per cwt	8s.6d.	to	10s.6d.
"	"	4s.	to	4s.9d.
" Godavari	"	6s.6d.	to	7s.
Nux Vomica, good	"	6s.	to	8s.
Orchella, Ceylon	"	12s.	to	28s.
Redwood	per ton	£3.	to	£3-10s.
Sandalwood, logs	"	£35	to	£55
" chips	"	£9	to	£30

Cawnpore Price Current.

March 29th, 1894.

	Per Maund.						
	Rs.	A.	P.		Rs.	A.	P.
Aonla fruits, dried	0	12	0	to	0	12	6
" leaves, dried bruised ...	1	12	0	to	2	0	0
Babul Bark	0	7	0	to	0	8	0
Bahera	1	12	0	to	1	14	0
Lac, Stick	24	0	0	to	25	0	0
Myrabolams	3	0	0	to	3	8	0
Moonj Grass	0	8	0	to	0	9	0
Gum, Babul	13	0	0	to	13	8	0
" Mixed	9	0	0	to	10	0	0

X.—EXTRACTS FROM OFFICIAL GAZETTES.

1.—Gazette of India

15th February, 1994.—No. 199-F.—With reference to the Notification of this Department, No. 2,81F., dated the 20th December last—Colonel Campbell relieved Mr. Hill of charge of the Central Forest Circle, North-Western Provinces and Oudh, on the afternoon of 18th December 1893, andcontinued in charge of that Circle till the afternoon of 9th January, 1894, when he was relieved by Mr. Wild.

Mr. Hill assumed charge of the office of Inspector General of Forests on the afternoon of 21st December, 1893, when Mr. Ribbentrop went on privilege leave.

Colonel Campbell officiated as Conservator of Forests of the 3rd grade from 19th December, 1895, to 9th January 1894, both dates inclusive.

28th February, 1894.—No.294-.F—Furlough for eight months under Article 340(*b*) of the Civil Service Regulations, is granted to Mr. J. W. Oliver, Conservator of Forests. 2nd grade, Eastern Circle, Upper Burma, with effect from 29th March, 1894, or the subsequent date on which he may be permitted to avail himself of it.

18th March, 1894.—No. 309.—Mr. E. P. Dansey. Conservator of Forests, 2nd grade, Bengal, availed himself, on the afternoon of 22nd February, 1894, of the furlough granted him in the Notification of this Department, No. 1059 F., dated the 12th October last.

Mr. A. E. Wild, Conservator, 3rd (Officiating 2nd) grade, is appointed Conservator of the Bengal Forest Circle, during Mr. Dansey's absence, or until further orders, and will assume charge of that Circle on being relieved of the charge of the Central Forest Circle of the North Western Provinces and Oudh.

Mr. R. H. E. Thompson, Conservator, 3rd grade, Northern Circle, Central Provinces, is appointed to officiate in the 2nd grade, *vice* Mr. Dansey, with effect from 23rd February, 1894, and until further orders.

Mr. H. H. Davis, Deputy Conservator, 1st grade, Bengal, is appointed to officiate as Conservator, 3rd grade, in charge of the Bengal Forest Circle, with effect from 23rd February, 1894, and until relieved by Mr. Wild.

2.—Madras Gazette.

8th March, 1894.—No. 118.—Messrs. C. G. Douglas and E. D. M. Hooper, Deputy Conservators of Forests, Madras, have been permitted by the Right Honorable the Secretary of State for India to return to duty within the period of their leave.

12th March 1894.—No. 119.—

No.	Name and designation of Officer.	Present grade.	Grade to which promoted.	Nature of promotion.	Remarks showing cause of vacancy, &c.
1	Mr. F. Foulkes, Acting District Forest Officer, South Canara.	Assistant Conservator of Forests, 2nd Grade.	Assistant Conservator of Forests, 2nd Grade.	Permanent.	With effect from 18th January, 1894.

POSTING.

12th March, 1894.—No, 120.—

No.	Name of Officer.	District.	Nature of charge.	Remarks.
1	Mr. F. Foulkes, Assistant Conservator of Forests, 1st Grade.	South Canara.	District Forest Officer.	Confirmation of Acting District Forest Officer.

13th March, 1894.—N. S. Veeracharlu, Forest Ranger, on special duty, Bellary, is transferred to Ganjam District on public service.

16th March, 1894.—The six months' leave on medical certificate granted in Service Order No. 208 of 1893 to Mr. C. P. Howell, Sub-Assistant Conservator of Forests, Madura is extended by one month.

3.—Bombay Gazette

19th February, 1894.—Mr. W. F. D. Fisher, Assistant Conservator of Forests, Second Grade, delivered over and Mr. F. R. Dassi, Deputy Conservator of Forests, N. C., received charge of the Divisional Forest Office, Panch Mahals, on the 12th February, 1894, in the afternoon.

2nd March —No. 1638.—Mr. W. R. Woodrow, Deputy Conservator of Forests Third Grade, and Divisional Forest Officer, Dhárwár, is allowed furlough one year and seven months from 1st May, 1894, or such subsequent date as he may avail himself of it.

7th March, 1894 —No. 1,702,—Mr. R. C. Wrenghton, Deputy Conservator of Forests, First Grade, has been allowed by Her Najesty's Secretary of State for India to return to duty within the period of his leave.

12th March, 1894 —Mr. A. N. Master, Extra Assistant Conservator of Forests, Fourth Grade, delivered over and Mr. C. Greathead, Divisional Forest Officer, East Thana, received charge of, the Shâhâpur Sub-Division Office on the 26th February, 1894, in the afternoon.

Mr. F. R. Dassi, Deputy Conservator of Forests, N. C., delivered over and Mr. A. N. Master, L. C. E., Extra Assistant Conservator of Forests, Fourth Grade, received charge of, the Divisional Forest Office, Panch Mahals, on the 1st of March, 1894, before noon.

14th March, 1894.—Mr. C. M. Hodgson, acting Deputy Conservator, delivered over and Mr. H. Mitra, Extra Assistant Conservator, received charge of the Divisional Forest Office, Working Plans Party No. 1, Southern Circle, on the afternoon of the 8th March, 1894.

19th March, 1894.—Mr. G. P. Millett, Deputy Conservator of Forests and Divisional Forest Officer, West Thana, has been granted one month's privilege leave from th 10th April, 1894.

23rd March, 1894.—Mr. Sheshu Manju, Extra Assistant Conservator of Forests and Sub-Divisional Officer, Haliyál, who was in this Office, No. 6,119, dated 2nd February, 1894, transferred to the Supa Range delivered over charge of the Haliyál range on the 4th instant after office hours, and received that of the Supa Range on the 7th idem, after office hours.

26th March, 1894 —No. 2174.—His Excellency the Governor in Council is pleased to appoint Mr. Vishnu Mahádev Tilak to act as Extra Assistant Conservator of Forests, Fourth Grade, during the absence of Mr. J. H. Clabby, or pending further orders.

28th March, 1894.—No. 2,220.—Mr. W. F. D. Fisher, Assistant Conservator of Forests, Second Grade, and Divisional Forest Officer Panch Mahále, is granted an extension, by one month, of the privilege leave of absence for one month allowed to him in Notification, dated 13th February last, published at page 174 of the *Bombay Government Gazette* of the 22nd idem, Part 1, by the Deputy Conservator of Forests, N. C.

4.—BENGAL GAZETTE.

5th March, 1894.—The following officers held temporary charge of the Chittagong Forest Division for the periods named in each case (below) :—

Babu Jago Mohun Bhattacharjee, Personal Assistant to the Commissioner of the Chittagong Division, from the afternoon of the 24th September, 1893 to the afternoon of the 27th September, 1893.

Mr. J. A. Cave-Browne, Assistant District Superintendent of Police, Chittagong Hill Tracts, from the afternoon of the 27th September, 1893 to the forenoon of the 8th November, 1893.

Mr. C. S. Murray, C.I.E., Assistant Commissioner, Chittagong Hill Tracts, from the forenoon of the 8th November, 1893, to the afternoon of the 19th idem.

27th March 1893—No.—1685For. Mr. E. E. Slane, Extra-Assistant Conservator of Forest, Sundarban Division, is granted 2 months and 22 days' privilege leave, under article 291 of the Civil Services Regulations, with effect from the 28th March, 1894, or any subsequent date on which he may avail himself of it.

5—N. W. P. AND OUDH GAZETTE.

30th March, 1894.—No. 1054.—The following temporary promotions and reversions among Forest Officers are notified for general information :—

Entry No.	With effect from—	Consequent on—	Name.	From—	To—
1	29th Jan. 1894.	Mr. A. G. Hobart-Hampden, on privilege leave.	Mr. A. P. Grenfell ...	Asst. Convr. 1st grade.	Offg. Deputy Convr. 4th gd.
2	1st Feb. 1894.	Mr. N. Hearle, on furlough.	Mr. E. A. Down ...	Depy. Convr. 3rd grade.	Offg. Deputy Convr. 2nd gd.
			Mr. A. G. Hobart-Hampden, on privilege leave.	Dy. Convr. 4th grade.	Offg. Deputy Convr. 3rd gd.
			Mr. B. A. Rebsch ...		
			Mr. B. B. Osmaston .	Asst. Convr. 1st grade.	Offg. Deputy Convr. 4th gd.
			Mr. F. A. Leete ...	Asst. Convr. 2nd grade.	Offg. Deputy Convr. 1st gd.
3	28th Feb. 1894.	Mr. A. G. Hobart-Hampden's return from privilege leave.	Mr. B. A. Rebsch ...	Offg. Deputy Convr. 3rd gd.	Depy. Convr. 4th grade.
			Mr. A. P. Grenfell ...	Offg. Deputy Convr. 4th gd.	Asst. Convr. 1st grade.
4	11th Mar. 1894.	Mr. E. Mc A. Moir, on furlough.	M. W. Shakespear ...	Depy. Convr. 2nd grade.	Offg. Deputy Convr. 1st gd.
			M. F. B. Bryant ...	Depy. Convr. 3rd grade.	Offg. Deputy Convr. 2nd gd.
			Mr. B. A. Rebsch .	Depy. Convr. 4th grade.	Offg. Deputy Convr. 3rd gd.
			Mr. A. P. Grenfell .	Asst. Convr. 1st grade.	Offg. Deputy Convr. 4th gd.

6.—PUNJAB GAZETTE.

26th February 1894.—No. 170.—A. L. No. 73.—*Promotion.*—With reference to Punjab Government Notification No. 103 dated 3rd February, 1894. His Honor the Lieutenant-Governor is pleased to make the following promotion to fill an existing vacancy :—

Mr. F. M. Coventry, Assistant Conservator of Forests 2nd Grade, to officiate as Assistant Conservator of Forests, 1st Grade, with effect from the 22rd January, 1894.

7.—CENTRAL PROVINCES GAZETTE.

6th March 1894.—No. 1,132.—Leave on urgent private affairs for six months, under Article 348 of the Civil Service Regulations, is granted to Mr. P. H. Clutterbuck, Officiating Deputy Conservator of Forests and Working-Plans Officer, with effect from the date on which he may be relieved of the charge of the Chhindwara Forest Division.

6th March 1894.—No. 1,133.— Mr. W. G. Gilmore, Forest Ranger, in charge of the Arvi-Ashti Range, Nagpur-Wardha Forest Division, is posted temporarily to the charge of the Chhindwara Forest Division, to work under the immediate orders of the Commissioner.

6th March 1894.—1,159.—Mr. Apa Saheb Mohite, Assistant Settlement Officer, returned from the three weeks' privilege leave granted him by Notification No. 6,077; dated the 29th December 1893, and assumed charge of his duties at Jubbulpore on the forenoon of the 29th January 1894.

8th March 1894.—No. 1,226.—Furlough for one year, under Article 340 (*b*) of the Civil Service Regulations, is granted to Mr. W. P. Thomas, Officiating Deputy Conservator of Forests, 1st grade, in charge of the Hoshangabad Forest Division, with effect from the 1st instant, or the subsequent date on which he may avail himself of it.

8th March 1894.—No. 1,227.—Mr. A. M. F. Caccia, Assistant Conservator of Forests, is posted to the charge of the Hoshangabad Forest Division, during the absence on furlough of Mr. Thomas, Deputy Conservator of Forests, or until further orders.

8th March 1894.—No. 1,244.—Mr. Shridhar Ganesh Pranjpe, Extra-Assistant Conservator of Forests, returned from the three months' privilege leave granted him by Notification No. 5,123, dated the 2nd November 1893, and, with reference to Order No. 222, dated the 11th January 1894, assumed charge of his duties as Working-Plans Assistant, Mandla Division, on the forenoon of the 1st February 1894.

13th March 1894.—No. 1,290.—With reference to Order No. 445, dated the 20th January 1894, Mr. Ramchandra Krishna, Extra-Assistant Conservator, and Mr. F. O. Lemarchand, Deputy Conservator of Forests, respectively surrendered and received charge of, the Balaghat Forest Division on the forenoon of the 15th February 1894.

21st March 1894.—No. 1,490.—Mr. P. H. Clutterbuck, Officiating Deputy Conservator of Forests and Working-Plans Officer, availed himself, on the afternoon of the 5th instant, of the six months' leave on urgent private affairs granted him by Order No. 1132, dated the 6th March 1894, making over charge of the Chhindwara Forest Division to the Deputy Commissioner, Chhindwara.

8.—BURMA GAZETTE.

24th February 1894.—No. 81.—Mr. A. Weston, Deputy Conservator of Forests, is placed in temporary charge of the Tenasserim Forest Circle, *vice* Major Bingham, proceeding on leave.

24th February 1894.—No. 8 .—In supersession of Revenue Department Notification No. 56, dated the 9th February 1894, Mr G F. R. Blackwell, Deputy Conservator of Forests, is transferred from Shwegyin to the charge of the Kado Forest division.

24th February 1894 —No. 83.—Revenue Department Notification No. 57, dated the 9th February 1894, transferring Mr. Ingram, Extra Assistant Conservator of Forests, from Tavoy to the charge of the Shwegyin Forest division is cancelled.

24th February 1894.—No 94.—So much of this department Notification No. 20, dated the 25th January 1894, as refers to Mr. Anthony is cancelled.

24th February 1894 —No. 85.—The following postings are ordered in the Forest Department:—

Mr. W. T. T. McHarg, from special duty in the Yaw Forest division to the charge of the Minbu Forest division.

Mr. H. B Anthony, from Thayetmyo to the charge of the Lower Chindwin Forest division.

26th February 1894 — No. 4.—With reference to Revenue Department Notifications Nos. 72 and 82 (Forests), dated respectively the 17th and 24th February 1894, Mr. G. F. R. Blackwell, Deputy Conservator of Forests, made over, and Mr. J. Messer, Assistant Conservator of Forests, received charge of, the Shwegyin division on the afternoon of the 22nd February 1894.

1st March 1894 —No. 4.—Under the provisions of section 46 of the Forest Act, 1881, Ma-ubin is hereby notified as a section for the reception of drift timber.

28th February 1894.—No. 1.—Mr. A. Weston, Deputy Conservator of Forests, made over, and Mr. G. F. R. Blackwell, Deputy Conservator of Forests, received charge of, the Kado division on the afternoon of the 28th February 1894.

6th March 1894.—No. 4.—With reference to Revenue Department Notification No. 47 (Forests), dated the 6th February 1894, Mr. C. B. Smales, Conservator of Forests, made over, and Mr. H. N. Thompson, Assistant Conservator of Forests, received charge of the Mingin subdivision, Lower Chindwin Forest Division, on the forenoon of the 26th February 1894.

26th February 1894.—No. 3.—With reference to Revenue Department Notifications Nos. 16 and 17 (Forests), dated the 23rd January 1894, Mr. J. T. Jellicoe, Deputy Conservator of Forests, Rangoon division, made over, and Mr. W. F. L. Tottenham, officiating Deputy Conservator of Forests, received charge of the Pegu division on the afternoon of the 24th February 1894.

15th February 1894.—No. 3.—Mr. H. N. Thompson, Assistant Conservator of Forests, reported his return from the three months and 15 days' privilege leave granted to him in Revenue Department Notification No. 407 (Forests), dated the 20th October 1893, at Monywa, on the forenoon of the 6th February 1894.

12th March, 1894.—No. 94.—Mr A. M. Burn-Murdoch, Assistant Conservator of Forests, is placed as a temporary measure in charge of the Minbu Forests division in addition to his other duties.

No. 96.—Mr. C. B. Smales, Assistant Conservator of Forests, was placed in temporary charge of the Mingin subdivision of the lower Chindwin Forest division from the 4th to the 25th February, 1894, inclusive.

No. 97.—(CORRIGENDUM).—In line 4 of the form of license prescribed in Revenue Department Notification No. 63 (Forests), dated the 13th February, 1894, *for* "the words 4 feet 2 inches in girth" *read* "2 feet 2 inches in girth."

21st March, 1894.—No. 103.—Under the provisions of Article 340 (*b*) of the Civil Service Regulations, furlough for 18 months is granted to Mr. C. H. Hobart-Hampden, Deputy Conservator of Forests, with effect from the 10th April, 1894, or the subsequent date on which he may avail himself of it.

No. 104.—Mr. F. J. Branthwaite, Assistant Conservator of Forests, as transferred to the Prome Forest division.

12th March 1894.—No. 6.—With reference to Revenue Department Notification No. 393, dated the 14th October, 1893, Mr. J. L. Lang, Extra Assistant Commissioner, relinquished charge of his duties as Forest Settlement Officer on the forenoon of the 10th March, 1894.

11.—MYSORE STATE GAZETTE

6th March, 1894.—No. 14,778.—G. F. 137-92.—Mr. S. A. Bapu Rao, Assistant Conservator of Forests, is appointed Head-quarter Assistant to the Inspector General of Forests, *vice* Mr T. Abdul Karim posted to the Mysore District.

No.—14,808—G 3,240.—Under Article 188 of the Mysore Service Regulations, Mr. G. Rama Rao, Forest Probationer in charge of the Shikarpur Sub-Division, was granted privilege leave of absence for one month and fifteen days from 21st November, 1893, to 4th January, 1894, both days inclusive.

No.—14,816—G. 3,249.—Under Article 188 of the Mysore Service Regulations, M. H. Muddappa, Sub-Assistant Conservator of Forests, Hassam District, is granted privilege leave of absence for 20 days from 15th March, 1894, or from such other date as he may avail himself of the same.

14th March, 1894.—No.15,285—G. F. 13-93.—Under Article 173 of the Mysore Service Regulations, Mr. C. E. M. Russell, Superintendent of Forests, Kadur District, has deen granted casual leave of absence for 13 days from the 3rd March, 1894.

19th March, 1894.—No.—15,761—G. 3,476.—Under Article 188 of the Mysore Service Regulations, Mr. Venkatanaranappa, Sub-Assistant Conservator of Forests, Tumkur District, was on privilege leave o absence for 2 months from 8th January, 1894.

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